

Fluorescence excitation-emission matrix spectroscopy as a tool for determining quality of sparkling wines

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Browning in sparkling wines was assessed by the use of excitation-emission fluorescence spectroscopy combined with PARAllel FACtor analysis (PARAFAC). Four different cava sparkling wines were monitored during an accelerated browning process and subsequently storage.

Fluorescence changes observed during the accelerated browning process were monitored and compared with other conventional parameters: absorbance at 420 nm (A420) and the content of 5-hydroxymethyl-2-furfural (5-HMF). A high similarity of the spectral profiles for all sparkling wines analyzed was observed, being explained by a four component PARAFAC model. A high correlation between the third PARAFAC factor (465/530 nm) and the commonly used non-enzymatic browning indicators was observed. The fourth PARAFAC factor (280/380 nm) gives us also information about the browning process following a first order kinetic reaction. Hence, excitation-emission fluorescence spectroscopy, together with PARAFAC, provides a faster alternative for browning monitoring to conventional methods, as well as useful key indicators for quality control. © 2016 Elsevier Ltd. All rights reserved.

Browning

Heating

Kinetic modeling

PARAFAC

Sparkling wine

Storage

Energy storage

Fluorescence

Fluorescence spectroscopy

Heating

Browning

Excitation-emission fluorescence spectroscopies

First-order kinetic reaction

Fluorescence excitation emission matrix

Kinetic modeling

PARAFAC

Parallel factor analysis

Sparkling wines

Quality control

chemical reaction kinetics

excitation

factorial analysis

fluorescence

fluorescence spectroscopy

model

monitoring

quality control

sparkling wine

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spectrofluorometry

wine

5-hydroxymethylfurfural

furfural

Food Analysis

Food Quality

Furaldehyde

Quality Control

Spectrometry, Fluorescence

Wine